

## **Prepackaged Mounting Assembly**

This application is a Continuation-In-Part of U.S. Patent Application Serial No. 10/723,122 entitled Fan Rated Junction Box Assembly, filed November 26, 2003, which  
5 is a Continuation-In-Part of U.S. Patent Application Serial No. 10/464,334 entitled  
Prepackaged Mounting Assembly and Bracket Combination, filed June 18, 2003, which  
is a Continuation-In-Part of 10/361,292 entitled "Prepackaged Mounting Assembly with  
Holstered Screws", filed February 10, 2003 now U.S. Patent 6,632,998, which is a  
Continuation-In-Part of U.S. Patent Application Serial No. 10/287,088 entitled  
10 "Prepackaged Mounting Assembly", filed November 4, 2002 now U.S. Patent 6,646,201,  
which is a Continuation-In-Part of U.S. Patent Application Serial No. 10/012,584 entitled  
"Prepackaged Mounting Assembly", filed November 7, 2001, now U.S. Patent 6,509,524,  
and is a Continuation-In-Part of U.S. Patent Application Serial No. 10/017,571 entitled  
"Electrical Fixture Mounting Box and Mounting Assembly", filed October 22, 2001, now  
15 U.S. Patent 6,677,523, which is a Continuation-In-Part of U.S. Patent Application Serial  
No. 09/784,981 entitled "Electrical Fixture Mounting Box and Mounting Assembly",  
filed February 16, 2001, now U.S. Patent 6,355,883, and is a Continuation-In-Part of U.S.  
Patent Application Serial No. 09/373,431 entitled "Electrical Fixture Mounting Box",  
filed August 13, 1999, now U.S. Patent 6,191,362, of which all of the above are  
20 incorporated by reference herein in their entirety.

## **Field of the Invention**

The present invention relates to mounting assemblies for electrical devices, and more particularly to an L-shaped mounting assembly for securing a device, such as a ceiling fan, light fixture, or similar device to an overhead beam.

## **Background of the Invention**

The present invention expands upon the concept of the prepackaged mounting assembly that is disclosed in and shares inventorship with U.S. Patents 6,509,524, 6,632,998, 6,646,201, and 6,677,523. The prepackaged mounting assemblies disclosed in these patents provide all the hardware needed for attaching a mounting assembly to an overhead beam, including all required fasteners to complete the installation, without the need for an outer wrap or separate packaging to hold the separate components.

In particular, U.S. Patent 6,646,201 provided an L-shaped mounting assembly that provided a large integral internal wiring cavity and also disclosed the use of an initial fastener for use in initially securing the mounting assembly to an overhead beam. By securing with the initial fastener, the installer's hands are advantageously freed to complete the remaining installation steps. Load bearing fasteners, which were held in temporary storage receptacles for shipment and storage, were then removed and driven into permanent receptacles and into the supporting beam to securely attach the L-shaped assembly thereto.

U.S. Patent 6,646,201 included an alternate embodiment of the L-shaped mounting assembly, which was to be preferred when there was no provision in the

mounting assembly for apertures for receipt of the load bearing fasteners or when the manufacturer's bracket included apertures extending beyond the side walls of the mounting assembly. This mounting assembly is installed initially with an initial mounting screw. The load bearing fasteners are then removed from their temporary storage  
5 receptacles and installed through the manufacturer's bracket and directly into the overhead beam to secure the assembly thereto. The load bearing fasteners are thereby installed outboard of the side walls of the lower junction box of the L-shaped mounting assembly and extend directly into the overhead beam. By moving the installation point of the load bearing fasteners outboard the side walls of the lower junction box, the alternate  
10 embodiment of the L-shaped mounting assembly could be used with virtually any oversized bracket provided separately by manufacturer's, including those for light fixtures, ceiling fans, or similar overhead electrical devices.

Although the alternate embodiment of disclosed in U.S. Patent 6,646,201 provided enabled the L-shaped mounting assembly to accommodate an oversize  
15 manufacturer's bracket, it was difficult to align the bracket with the mounting assembly and the beam to which it was attached.

Accordingly, what is needed is an L-shaped mounting assembly that provides an arrangement for aligning a manufacturer's bracket for proper installation of load bearing fasteners into the supporting beam. The mounting assembly should also provide a large  
20 cavity for wiring connections. The mounting assembly should furthermore have the advantage of providing a mounting structure that is capable of being stored, shipped, and sold as a prepackaged unit with all covers and fasteners required for installation self-contained within the unit. The mounting assembly should further have the advantage of

holding the cover and fasteners securely enough to permit storage, shipping, display and handling without the need for an outer wrap or separate packaging to retain the cover and fasteners with the assembly.

5

## **Summary of the Invention**

According to the present invention, there is provided a mounting assembly for securing a device, such as a ceiling fan, light fixture, or similar device to an overhead beam. The mounting assembly includes an L-shaped mounting box that includes a large side wiring cavity and an integral flange portion. A cover cooperates with the integral  
10 flange portion to provide a closure for the wiring cavity and a bottom flange for mounting a manufacturer's bracket thereon. The integral flange portion includes downward extending alignment posts to enable easy centering of the manufacturer's bracket. The bracket typically includes slots therein and the mounting assembly includes all hardware required to complete installation of the device including the cover, an initial fastener, and  
15 load bearing fasteners, which are all temporarily secured to the L-shaped box.

At the installation site, the cover may be removed temporarily and the initial fastener used to secure the box to an overhead beam. Wiring connections are then completed in the wiring cavity and the cover reinstalled. After being reinstalled on the mounting box, the cover protects the wiring connections from application of sheet rock,  
20 spackle, and paint around the fixture. The manufacturer's bracket is easily centered with the mounting box by slipping the bracket onto the alignment posts with the posts extending through the slots of the bracket. The load bearing fasteners are removed from

their temporary storage holsters and installed through the bracket and into the overhead beam to secure the bracket to the beam.

### **Description of the Drawings**

5            Fig. 1 is a perspective view of the L-shaped mounting assembly of the present invention.

            Fig. 2 is a bottom view of the mounting assembly of Fig. 1.

            Fig. 3 is a conceptual sectional view of the mounting assembly taken along line 3-3 of Fig. 2 and omitting the mounting box walls to show the relative positions of the  
10    initial fastener and load bearing fasteners in the mounting assembly.

            Fig. 4 is a sectional view of the mounting assembly taken along line 4-4 of Fig. 2.

            Fig. 5A is a top view of a cover which forms a portion of the mounting assembly of Fig. 1.

            Fig. 5B is a side view of the cover taken along line B-B of Fig. 5A.

15           Fig. 5C is an end view of the cover taken along line C-C of Fig. 5A.

            Fig. 6 is a boss detail.

            Fig. 7 is a boss detail including an initial mounting fastener.

            Fig. 8 is a perspective view of the mounting assembly of Fig. 1 after it has been initially mounted on a support beam by an initial mounting fastener and with the load  
20    bearing fasteners seated in their holsters.

            Fig. 9 is a perspective view of the mounting assembly of Fig. 1 after being secured to a support beam by load bearing fasteners driven through the manufacturer's bracket.

## Table of Nomenclature

The following is a listing of part numbers used in the drawings along with a brief description:

5	<u>Part Number</u>	<u>Description</u>
	20	prepackaged mounting assembly
	22	first junction box
	24	second junction box
	26	side walls of first junction box
10	28	top of second junction box
	30	first side of first junction box
	32	opposing sides of second junction box
	34	distal end
	36	lower surface of top
15	38	side walls of second junction box
	40	first arcuate flange
	40A	circular flange portion
	42	lower edge of first arcuate flange
	44	cover
20	46	second arcuate flange
	46A	circular flange portion
	48	lower edge of second arcuate flange
	50	alignment post
	52	holster
25	54	tubular projection
	56	inner surface
	58	load bearing fastener
	60	initial fastener
	62	removable wall sections or knockouts
30	64	top of first junction box
	66	fitting
	68	boss
	70	interior volume
	72	shallow cavity
35	74	deep cavity
	76	wide bore
	78	mouth
	80	narrow bore
	82	plane
40	84	point
	86	top surface

	88	closed slot
	90	open ended slot
	92	cover fasteners
	94	integral ears
5	96	beam
	98	bracket
	100	longitudinal slots
	102	seat

## 10 Detailed Description

The present invention is a prepackaged mounting assembly for mounting a suspended electrical fixture from an overhead beam.

With reference to Fig. 1, a preferred embodiment is shown of the prepackaged mounting assembly 20 which includes a first 22 and a second junction box integrally  
 15 formed in one piece. The first junction box 22 includes deep side walls 26 that end in a common lower plane. The second junction box 24 includes a top 28 that is integral with and extends orthogonally from a first side 30 of the first junction box 22.

Referring to Figs. 1 and 2, the top 28 of the second junction box 24 includes two opposing sides 32, a distal end 34, and a lower surface 36. Integral side walls 38 extend  
 20 downward from the lower surface 36 of the top 28 along the distal end 34 and along the opposing sides 32 of the second junction box 24. The side walls 38 of the second junction box 24 at the distal end 34 form a first arcuate flange 40 having a lower edge 42 ending in a common plane with the side walls 38 of the opposing sides 32. A cover 44 is secured to the deep side walls 26 of the first junction box 22. A second arcuate flange 46 projects  
 25 from the cover 44 and includes a lower edge 48. With the cover 44 secured to the side walls 26 of the first junction box 22, the lower edge 42 of the first arcuate flange 40 is coplanar with the lower edge 48 of the second arcuate flange 46. Two alignment posts 50

extend downward from the side walls 38 of the second junction box 24 at each of the opposing sides 32.

With reference to Figs. 1-3, the prepackaged mounting assembly 20 includes two holsters 52 consisting of tubular projections 54 integral with the inner surface 56 of the first side 30 of the first junction box 22. Each holster 52 includes a load bearing fastener 58 frictionally engaged therein for temporary storage with said prepackaged mounting assembly 20 prior to installation. The prepackaged mounting assembly also includes an initial fastener 60 frictionally engaged in the top 28 of the second junction box 24. One or more removable wall sections 62 or knockouts may be included in either the side walls 26 or top 64 of the first junction box 22 or in the top 28 of the second junction box 24. A snap in fitting such as the Black Button™ available from Arlington Industries, Inc., 1 Stauffer Industrial Place, Scranton, PA, may be inserted in one or more of the knockouts 62 such as the fitting 66 shown in the top 64 of the first junction box 22 in Fig. 2. As should be readily discernible from the bottom view in Fig. 2 of the prepackaged mounting assembly 20, with the cover 44 installed on the first junction box 22 as shown, the load bearing fasteners 58 and the initial fastener 60 are easily accessible from the bottom of the mounting assembly 20 as the tubular projections 54 which hold the load bearing fasteners 58 and the boss 68 which holds the initial fastener 60 are positioned well within the side walls 26 of the first junction box 22 and the side walls 38 of the second junction box 24. The first arcuate flange 40 and second arcuate flange 46 cooperate to form opposing circular flange portions 40A and 46A. The opposing circular flange portions 40A and 46A and the side walls 38 of the second junction box 24 define



an interior volume 70 therein. The interior volume 70 includes the shallow internal cavity 72 of the second junction box 24 and the deep cavity 74 of the first junction box 22.

Referring to Figs. 3 and 4, the load bearing fasteners 58 are held in their temporary storage positions in the holsters 52. The holsters 52 consist of tubular projections 54 integral with the inner walls of the first junction box 22. The tubular projections 54 include a wide bore 76 at the mouth 78 and a narrow bore 80 further within. The wide bore 76 is larger than the major thread diameter of the load bearing fastener 58, the narrow bore 80 is smaller than the major thread diameter, and both bores include smooth interior walls. Threads are formed by the load bearing fastener 58 in the narrow bore 80 portion of the tubular projections 54 as the load bearing fasteners 58 are axially advanced therein. After being threaded into the holsters 52, the load bearing fasteners 58 are held securely therein for shipment and storage and are easily accessible and removable when required at installation. As shown in Fig. 3, the load bearing fasteners 58 in temporary storage in the holsters 52 do not extend beyond a plane 82 connecting the coplanar arcuate flanges 40 and 46.

The initial fastener 60 is securely held in its boss 68 for shipment and storage. As shown in Figs. 6 and 7, the boss 68 is integral with the top 28 of the second junction box and with the initial fastener 60 inserted therein for shipment and storage, such as shown in Fig. 7, the point 84 of the initial fastener 60 does not extend beyond the top surface 86 of the top 28.

With reference to Figs. 5A-5C, the cover 44 includes a closed slot 88 on one end and an open ended slot 90 on the opposite end. This feature further facilitates ease of installation of the prepackaged mounting assembly 20 as the cover fasteners 92, depicted

in Fig. 3, can be loosened slightly allowing the cover 44 be rotated away from the mounting assembly 20. The installation task is therefore made easier for the installer by allowing the cover 44 to be simply rotated away from the mounting assembly 20 to allow access to the interior of the first junction box 22 and then rotated back into place. The  
5 second arcuate flange 46 extends downward from the cover 44 and includes a lower edge 48 as shown in Figs. 5B and 5C. As shown in Fig. 3, integral ears 94 are included on the first junction box 22 for receipt of cover fasteners 92.

With reference to Figs. 4 and 8, it should be noted that the top 28 of the second junction box 24, being orthogonal to the first side 30 of the first junction box 22, forms a  
10 seat 102 thereon for flush placement against an overhead beam 96.

For operation of the prepackaged mounting assembly 20, the reader is referred to Figs. 8 and 9. Fig. 8 depicts the prepackaged mounting assembly 20 placed against the beam 96 with the load bearing fasteners 58 held securely in the holsters 52 for shipment and storage. As shown in Fig. 8, the prepackaged mounting assembly 20 is placed against  
15 the beam 96 such that the seat 102 including the first side 30 and top 28 are flush against the beam 96. The initial fastener 60 is then driven into the beam 96 thereby securing the prepackaged mounting assembly 20 to the beam 96. It should be noted that the purpose of the initial fastener 60 is to hold the mounting assembly 20 in place thereby freeing the installer's hands. The bracket 98, which is typically supplied with the electrical fixture by  
20 the manufacturer, is then lifted upwards until the longitudinal slots 100 are fitted upon the alignment posts 50. It should be noted that the alignment posts 50 have a width less than that of the longitudinal slots 100. Preferably the alignment posts 50 are between 0.15 and 0.20 inch in width and even more preferably 0.18 inch in width. The alignment posts 50

are preferably between 2.6 and 3.5 inches apart measured between their outer sides and most preferably are 3.11 inches apart. These critical dimensions of the alignment posts 50 permit them to accommodate a wide range of brackets commonly supplied by manufacturers with their electrical devices.

5           The load bearing fasteners 58 are then removed from their temporary storage positions in the holsters 52, as shown in Fig. 8, and placed through the longitudinal slots 100 of the bracket 98 and driven into the overhead beam 96 as depicted in Fig. 9. to securely fasten the bracket 98 and prepackaged mounting assembly 20 to the overhead beam 96. It should be noted that the alignment posts 50 and second junction box 24 are of  
10   a size to position the load bearing fasteners 58 outside of the opposing sides 32 of the second junction box 24. This insures that all of the weight of the fixture (not shown) that will be suspended from the bracket, is supported by the beam 96 and not by the prepackaged mounting assembly 20.

          After the prepackaged mounting assembly 20 is secured to the beam 96 by the  
15   load bearing fasteners 58 as shown in Fig. 9, the installer can then loosen the cover fasteners 92 and rotate the cover 44 away from the first junction box 22, complete wiring connections between the supply and fixture (not shown), rotate the cover 44 closed upon the first junction box 22, and tighten securely with the cover fasteners 92.

          The first 22 and second junction boxes 24 of the prepackaged mounting assembly  
20   of the present invention are preferably molded in one piece from plastic. An especially preferred material of construction is polycarbonate, although they could be molded of other elastomeric materials.

The prepackaged mounting assembly of the present invention provides flexibility by supporting a wide range of fixtures of the type that include a mounting bracket. The prepackaged mounting assembly further provides the advantage that all of the required hardware for mounting the electrical fixture is included with the assembly. The possibility of mistakes from using a fastener that is inadequate for supporting the intended load is thereby minimized. By including all the fasteners temporarily secured in storage locations within the assembly, the prepackaged mounting assembly minimizes the chance of an installer will lose a critical fastener. By freeing the installer's hands, there is much less chance of a fastener being dropped. By locating the load bearing fasteners inside the interior volume of the assembly for shipment and storage, the fasteners are thereby protected during shipment and storage and facilitate ease of packaging. Inclusion of the alignment posts provides an arrangement for quickly aligning a manufacturer's bracket for proper installation of load bearing fasteners into the supporting beam. The prepackaged mounting assembly furthermore provides a large cavity for wiring connections. The prepackaged mounting assembly of the present invention provides the advantage of holding the cover and fasteners securely enough to permit storage, shipping, display, and handling without the need for an outer wrap or separate packaging to retain the cover and fasteners with the assembly.

As the invention has been described, it will be apparent to those skilled in the art that the same may be varied in many ways without departing from the spirit and scope of the invention. Any and all such modifications are intended to included within the scope of the appended claims.